Forces and Motion Simulation
Honors Physics

23 Points Total

Instructions and Rubric:

1. Go to phet.colorado.edu; play with sims; physics; motion; forces and motion; run now.
2. There are four tabs on the top of the simulation: Introduction, Friction, Force Graphs, and Robot Moving Company. Click the Friction tab.
3. Answer the following questions:
    a. How does changing the mass affect the amount of applied force necessary to put the object in motion? (3 points)
    b. How does changing the static friction affect the amount of force necessary to put the object in motion? (3 points)
    c. How does changing the acceleration due to gravity affect the amount of force necessary to put the object in motion? (3 points)
    d. What is the difference between static and kinetic frictions? (2 points)
4. Click the Force Graphs tab, and check the box in red that says F(Friction). If the forces are too difficult to detect on the graphs, use the +/- magnifying glasses to zoom in or out. Press the 'clear' button to reset the time.
5. Answer the following questions:
    a. What happens to the force of friction when the small crate begins to move? (2 points)
    b. Draw the applied and friction force functions on a force versus time graph (2 points).
6. Change objects to the file cabinet. Repeat #5b (2 points).
7. Change objects to the refrigerator. Again, repeat #5b (2 points).
8. Discuss qualitatively how the friction force functions of the small crate, file cabinet, and refrigerator compare (2 points).
9. Click the Robot Moving Company tab. Play the game a minimum of five times using your knowledge of forces to achieve a high score. Record your highest score (1 point).